Cariboo-Chilcotin Land Use Plan

Mountain Caribou Strategy

October 2000

Caribou Strategy Committee

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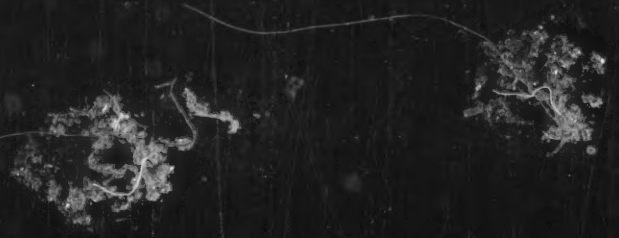
OUTLINE OF PRESENTATION

- Key background Information
- Population Status Update
- Habitat Strategy
- Timber Harvesting Strategy



OUTLINE OF PRESENTATION

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- Access Management
- Predator Management
- Conservation Risk Assessment
- Consultation
- Key Recommendations

INTRODUCTION

- Maintaining habitat values for mountain caribou has been identified as an overriding objective within the CCLUP
- CCLUP has provided 'No Harvest' and 'Modified Harvest' target to allow for maintenance of mountain caribou habitat

INTRODUCTION

Committee Tasks

- To undertake research, inventory and mapping projects required for developing an *integrated* caribou habitat management strategy.
- To identify the 35% 'modified harvest' and 65% 'no harvest' areas.
- To identify operational management strategies, including stand level and landscape level recommendations
- To develop and define 'modified harvesting' for caribou habitat
- To define portions of the caribou range which are sensitive to snowmobile use

BACKGROUND

- Mountain caribou are a unique ecotype of woodland caribou
- Arboreal lichen feeders during winter
- Dependent on mature and old-growth timber for survival
- Require large connected areas of suitable habitat
- Extremely vulnerable to predation
- Exist at relatively low densities

BACKGROUND

Based on current knowledge, caribou habitat and populations can only be maintained if *all* of these issues are addressed together

- Maintaining suitable caribou habitat
- Limiting and regulating roaded access and motorized recreation in caribou habitat
- Managing predation levels on caribou

BACKGROUND

- Population status
- Habitat use
- Mortality

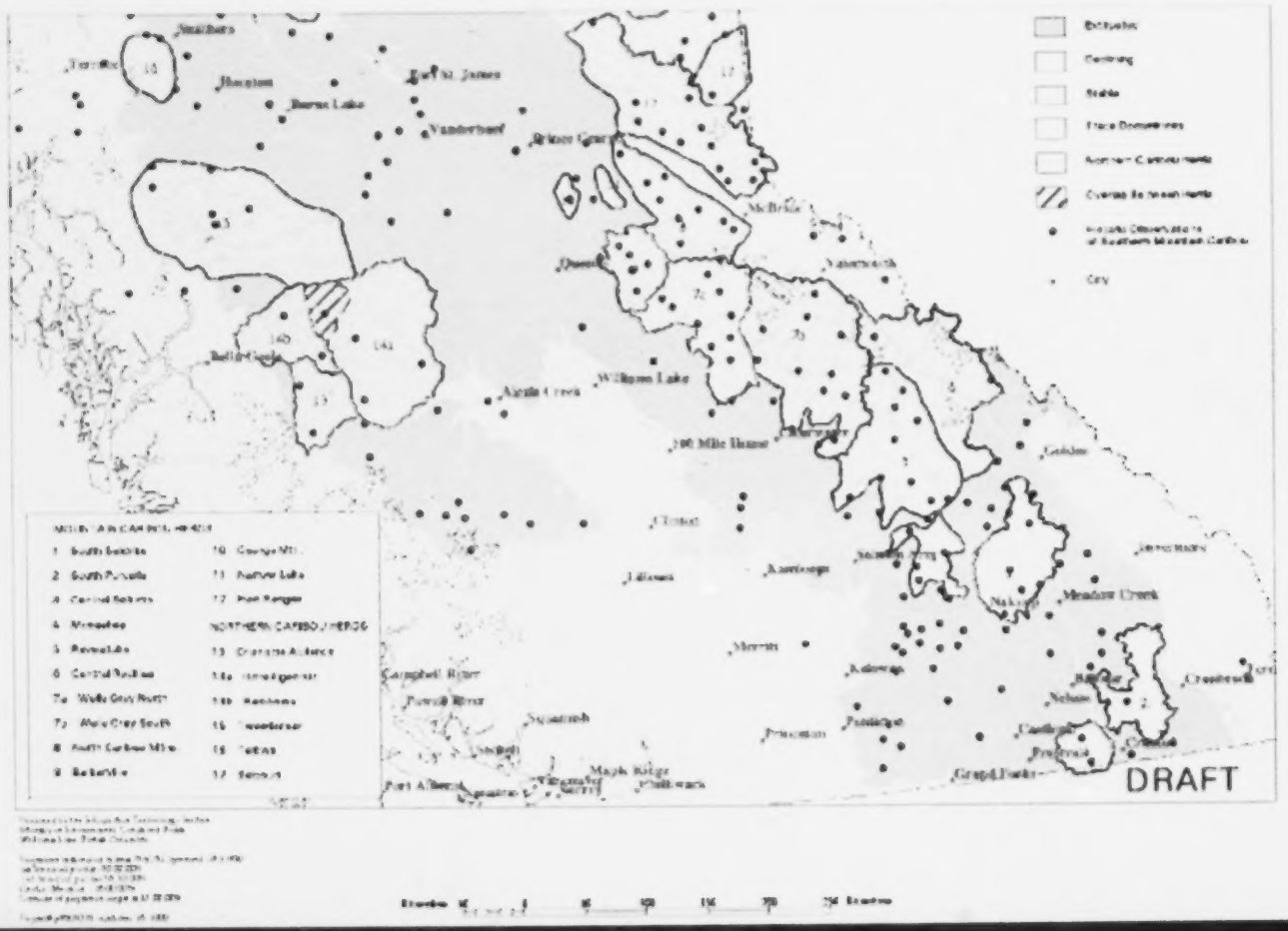
BACKGROUND

Mountain Caribou Distribution and Abundance

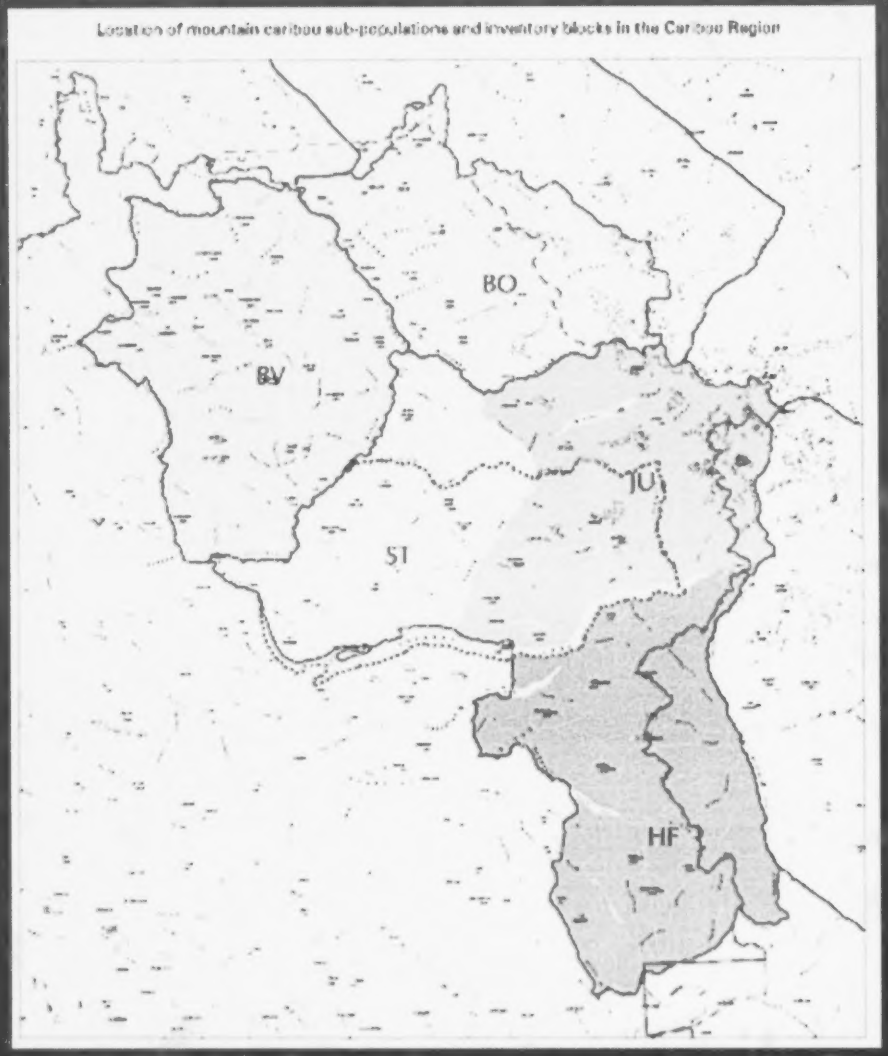
- There are less than 2,500 mountain caribou in the world and about ninety-eight percent of these animals live in B.C.

- The provincial population is divided into 13 sub-populations or herds:
  - Herds range in size from about 20 to 450 animals
  - Seven herds have populations of less than 60 animals
  - Nine herds are presently considered stable
  - Four herds are considered to be presently declining

Historic and current distribution of mountain caribou in southern BC



CCLUP Mountain Caribou Strategy



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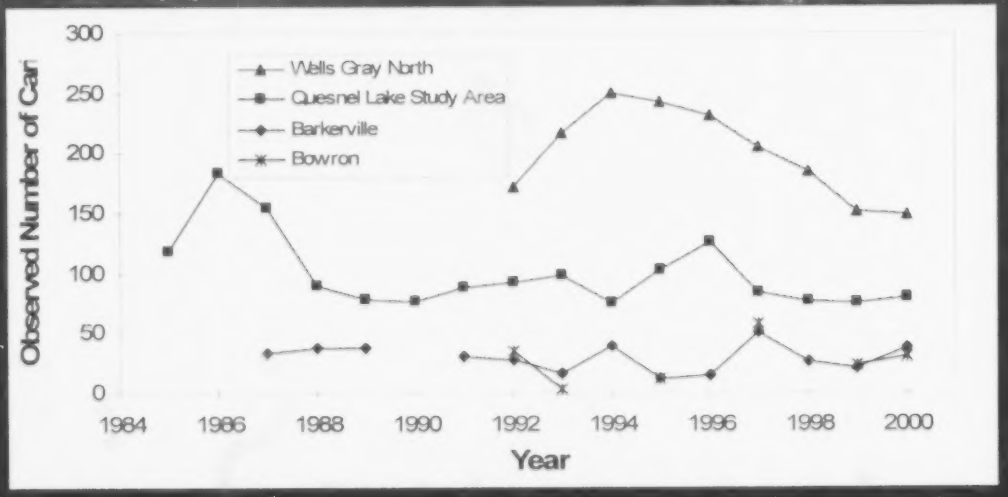
BACKGROUND

Mountain Caribou Distribution and Abundance



Mountain Caribou survey results within the Cariboo Region, 1984 – 2000 (incomplete surveys of theQuesnel Lake Study Area in 1985 and 1989; incomplete survey of the Wells Gray North sub-population in 1992).

BACKGROUND

Mountain Caribou Distribution and Abundance

Major Mortality Factors

- Predation
- Avalanches
- Accidents

BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Radio Tracking provides useful information about wildlife populations

- Animal movements
- Home range estimates
- Habitat use information
- Mortality rates
- Population estimates

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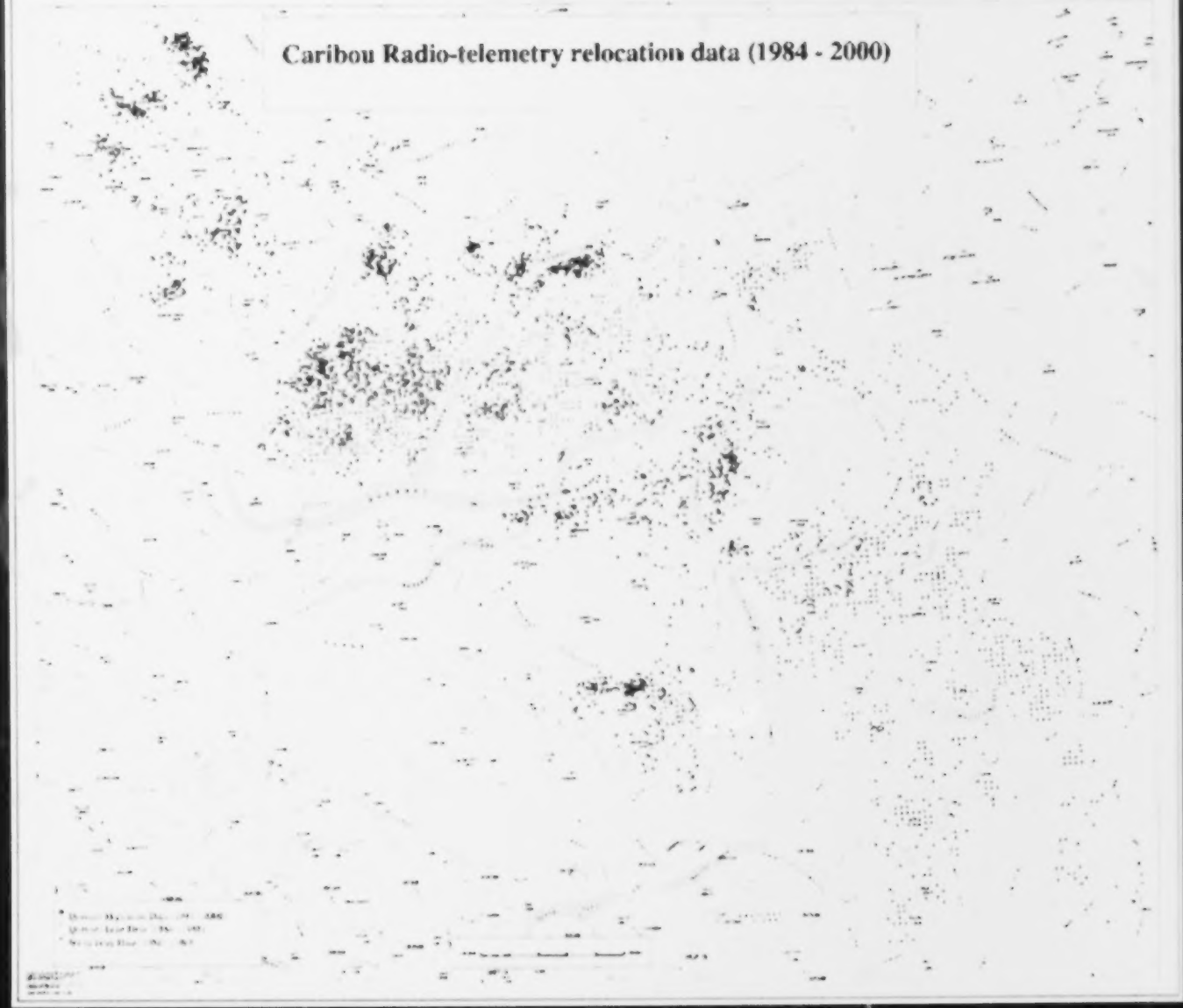
BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Summary of radio-telemetry studies overlapping with Mountain Caribou range

Project	Described by	Monitoring Period	Animal Sample	Data Points By season				Total Points
				EW	LW	SP	SU	
Quesnel Highland	Young and Roorda (2000)	12/93 – 05/99	43	706	794	369	844	2713
Quesnel Lake	Seip (1992)	02/84 – 04/88	32	242	452	292	794	1780
Wells Gray Park	Seip (1990)	03/86 – 03/89	31	205	353	197	630	1385
Total			106	1153	1599	858	2268	5878

Seasons are as described by Simpson et al. (1997)
EW – Early Winter (November 1 – January 15)
LW – Late Winter (January 16 – April 15)
SP – Spring (April 16 – May 31)
SU – Summer (June 1 – October 31)


Caribou Radio-telemetry relocation data (1984 - 2000)

BACKGROUND

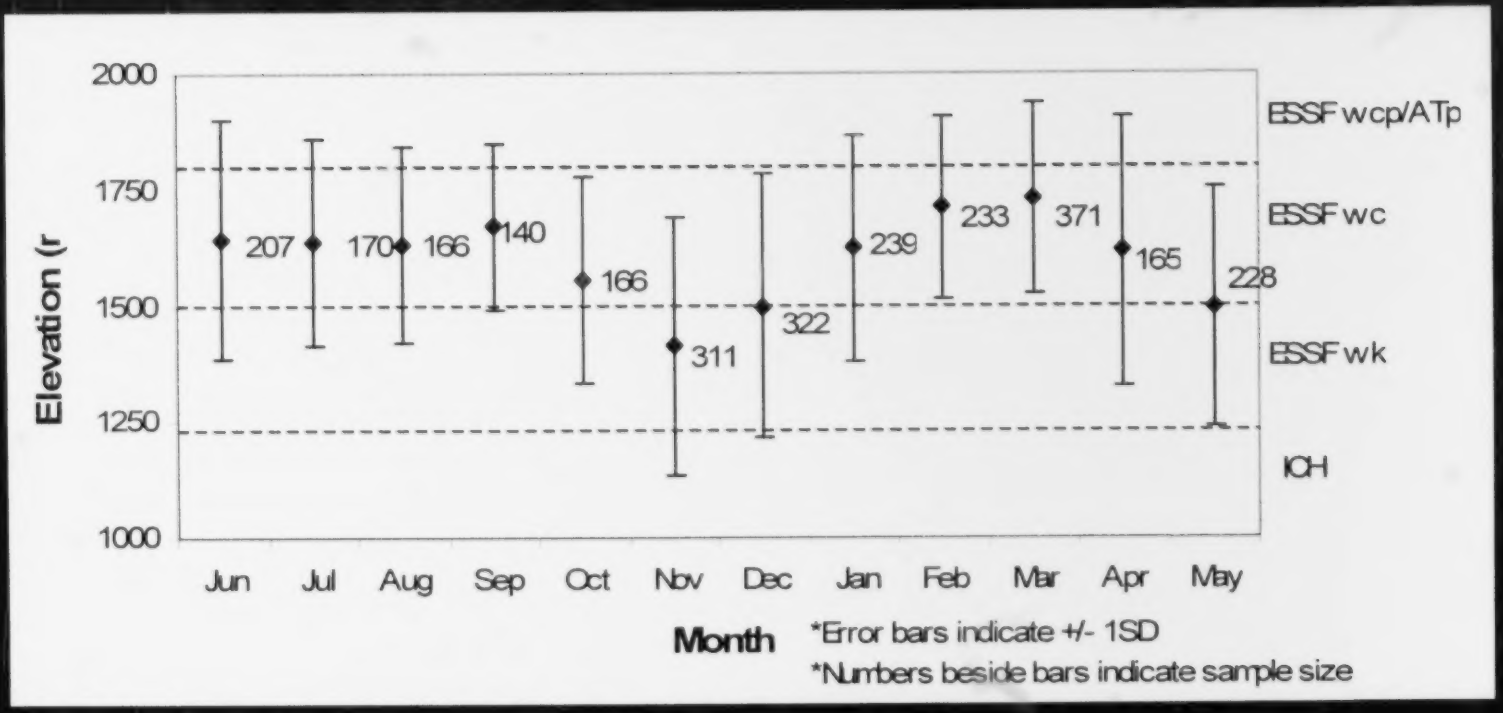
Habitat Suitability Index Modeling

Predictive habitat suitability maps were developed to aid in the refinement of 'no harvest' and 'modified harvest' areas:

- Utilized over 6000 telemetry points from over 150 animals
- Considered 21 forest cover and terrain variables
- Evaluated selection at four spatial scales
- Results identified different habitat needs within two areas:
  - highland zone
  - mountain zone
- Developed maps for each of the four identified seasons

BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use



Monthly elevation use of radio-collared caribou (from Young and Roorda, 2000).

BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Summer/Fall Habitat Use:

- Between 1250 – 2000 m. elevation
- ESSF zone
- Gentle slopes
- Cool aspects
- Mature and old forests
- Balsam and Spruce stands

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BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Summer/Fall Habitat Use

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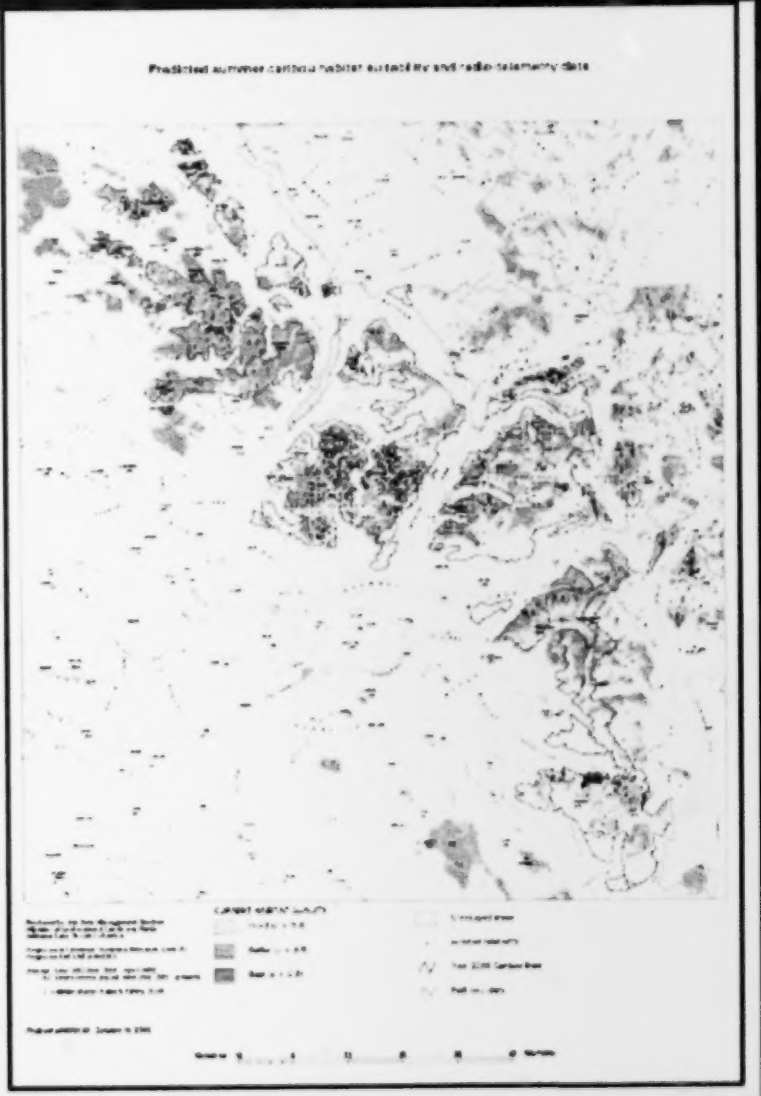

BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Early Winter Habitat Use

- Varies slightly between zones
- Between 1000 – 2000 m. elevation
- ICH and ESSF zone
- Gentle slopes
- Mature and old forests
- Cedar and hemlock in ICH
- Balsam and spruce in ESSF

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BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Early Winter Habitat Use

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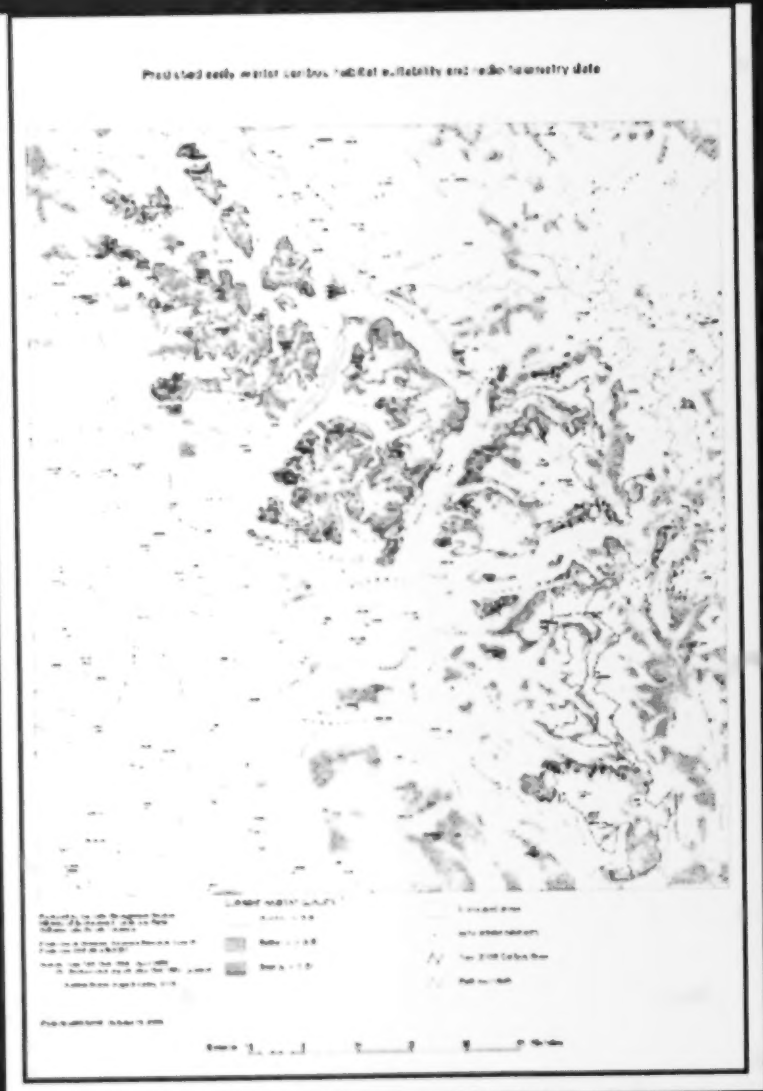

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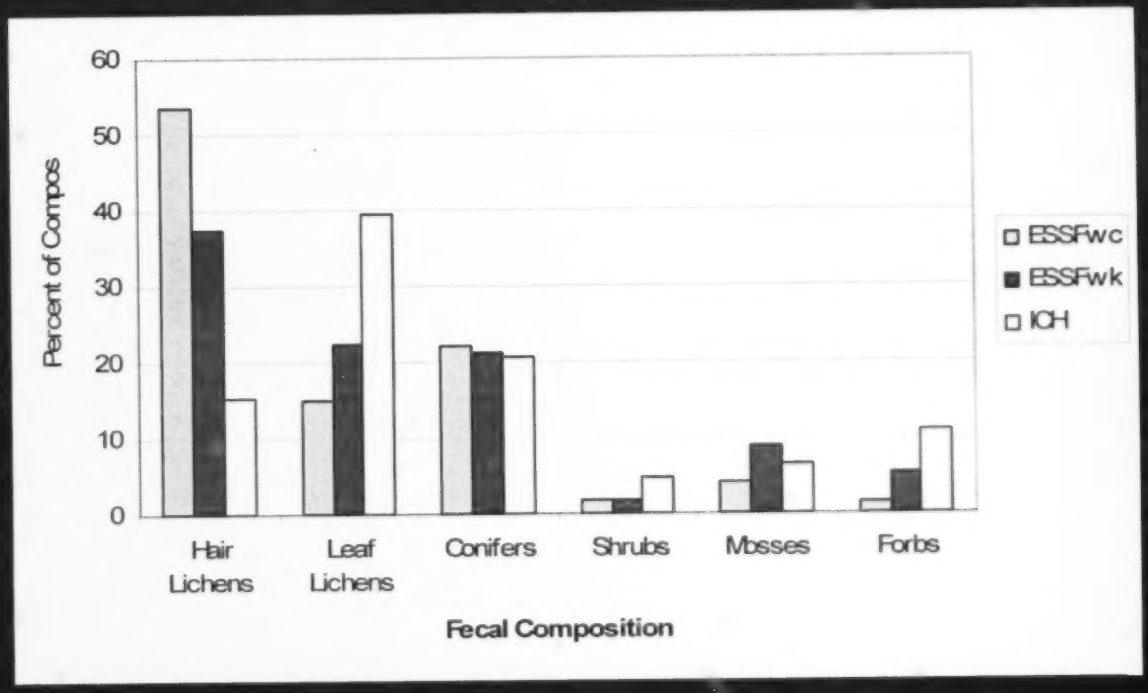
BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use



Early winter diet of mountain caribou in the Cariboo Region. (Samples collected from November 17, 1995 to January 25, 1996 and November 19 to December 18, 1996; sample sizes were ICHwk n=9; ESSFwk n=3 and ESSFwc & wcp n=14).

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BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Late Winter Habitat Use

- Between 1500 – 2000 m. elevation
- Middle and Upper ESSF sub-zones
- Gentle slopes
- Mature and old forests
- Balsam and Spruce Stands

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BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Late Winter Habitat Use

- Between 1500 – 2000 m. elevation
- Middle and Upper ESSF sub-zones
- Gentle slopes
- Mature and old forests
- Balsam and Spruce Stands

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BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Spring Habitat Use

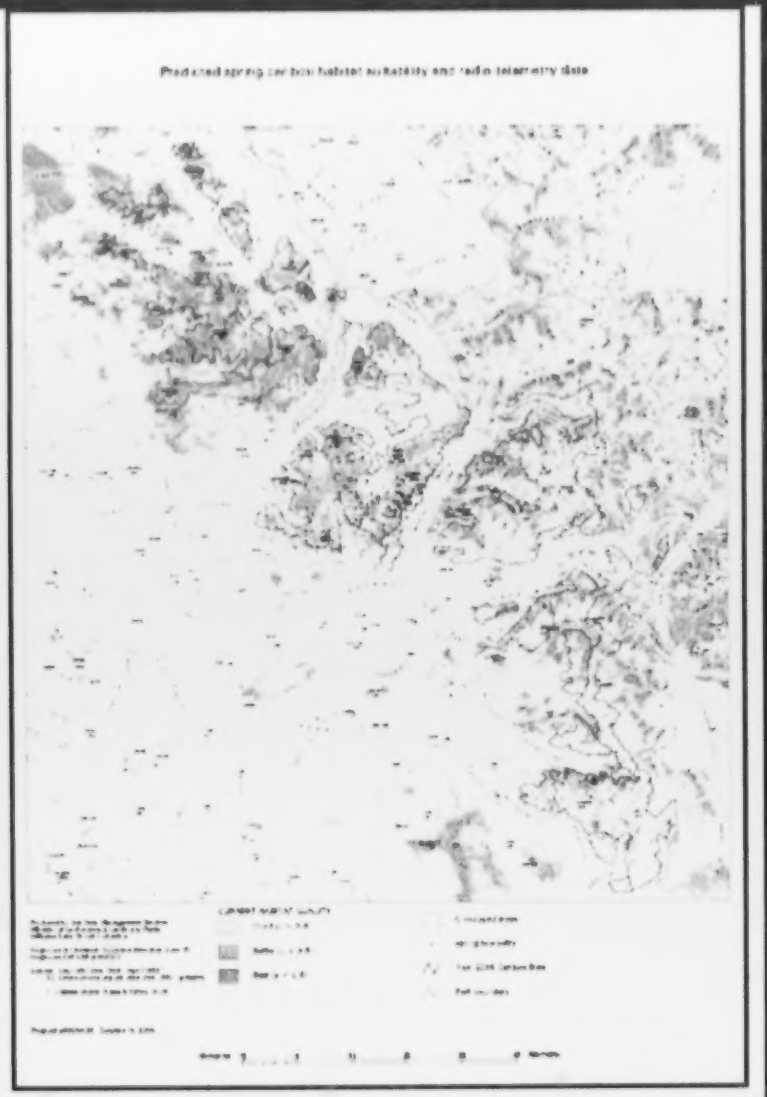
- Between 1000 – 2000 m. elevation
- ICH and ESSF zones
- Gentle to moderate slopes
- Warm aspects
- Mature and old forests
- Balsam and Spruce stands

BACKGROUND

Mountain Caribou Seasonal Patterns of Habitat Use

Spring Habitat Use

- Between 1000 – 2000 m. elevation
- ICH and ESSF zones
- Gentle to moderate slopes
- Warm aspects
- Mature and old forests
- Balsam and Spruce stands



TARGETS

CCLUP TARGETS FOR EASTERN CARIBOU

General Direction to the Committee:

- 65/35 split of 'no harvest' and 'modified harvest' by sub-unit
- Major adjustments (trades) are possible as long as they have a neutral impact to timber values

Approved 1998 CCLUP targets by sub-unit (areas in hectares of productive forest land)

CCLUP Sub-Unit	35% 'Modified Harvest'	65% 'No Harvest'	Deferral Area
Cottonwood	3,922	7,285	11,207
Canim	2,681	4,978	7,659
Boss/Deception	7,352	13,655	21,007
Quesnel Highland	13,235	24,580	37,815
Quesnel Lake	20,999	38,998	59,997
TOTAL	**48,189**	**89,496**	**137,685**

HABITAT STRATEGY

Recommended Location of Mountain Caribou Target

Criteria for delineating Caribou Habitat Areas:

'No harvest' areas were selected based on the following criteria:

- Areas of moderate or high caribou use
- Areas of moderate to high suitability
- Relatively large areas were identified instead of small areas

HABITAT STRATEGY

Recommended Location of Mountain Caribou Target

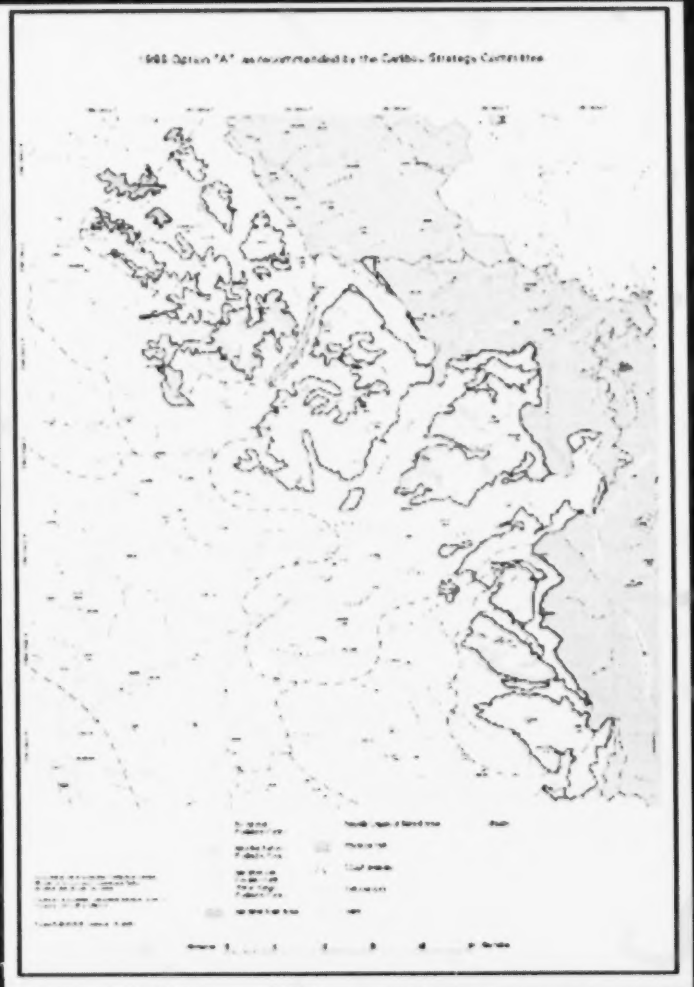
Criteria for delineating Caribou Habitat Areas:

At the landscape level, the identification of 'modified harvest' as compared to 'no harvest' areas for eastern caribou utilized criteria as follows:

- Areas of lower current use
- Areas of lower present suitability
- Areas of lower recreational accessibility
- Relatively large areas
- Peripheral areas
- Quesnel District trade agreements considered

HABITAT STRATEGY

Recommended Location of Mountain Caribou Target



CCLUP TARGETS FOR EASTERN CARIBOU

Quesnel District Trade Agreements

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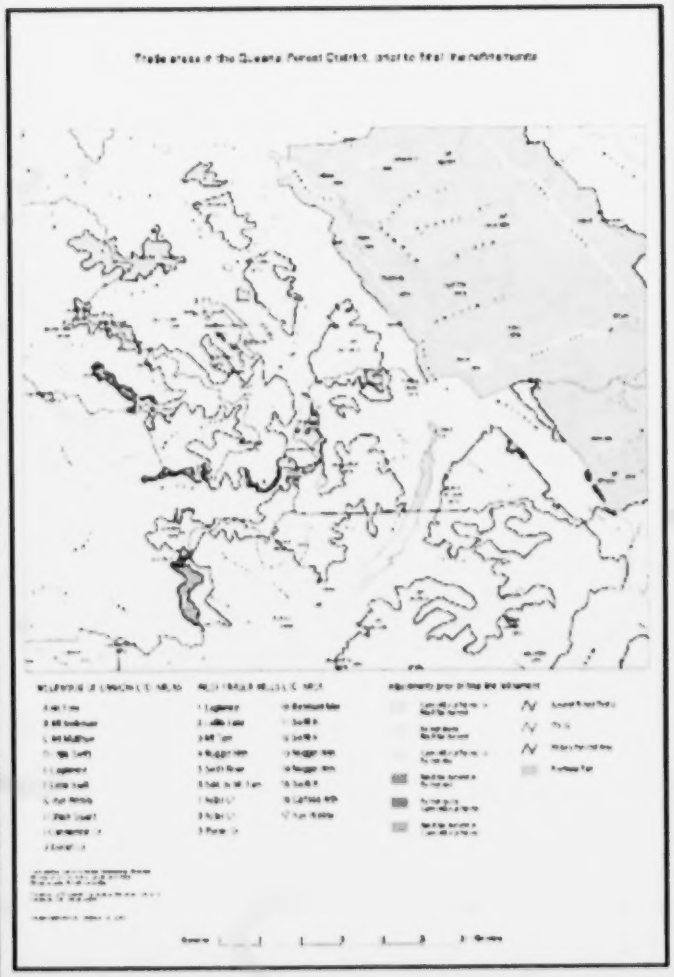
Target based on trades within the Quesnel District

CCLUP Sub-Unit	'Modified Harvest' Target	'No Harvest' Target	Total Area with Caribou Target
Cottonwood	5,658	6,882	12,540
Canim	2,681	4,978	7,659
Boss/Deception	7,352	13,655	21,007
Quesnel Highland	16,819	22,724	39,543
Quesnel Lake	20,999	38,597	59,596
TOTAL	**53,509**	**86,836**	**140,345**



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HABITAT STRATEGY

Recommended Location of Mountain Caribou Target

Criteria for refining caribou area boundaries:

- The seasonal habitat suitability index model maps
- Input from the forest industry and the conservation sector
- Generally, the lower limit of high elevation habitat is approximately 1500 meters elevation
- Steeper terrain is of lower quality to mountain caribou
- Cool aspects at mid elevations, with gentle terrain, are of high value to mountain caribou
- Consider existing or approved logging

HABITAT STRATEGY

Recommended Location of Mountain Caribou Target

Major changes are:

- Inclusion of a few, key low-elevation early winter ranges around Quesnel Lake
- New 'conventional harvesting' in several large areas
- Addition of 'modified harvest' to the 100 Mile House TSA west of Boss Mountain
- New 'modified harvest' in the upper Horsefly drainage
- In the Quesnel TSA, new 'modified harvest' areas due to trades
- In the Quesnel TSA, new 'conventional harvesting' areas due to trades

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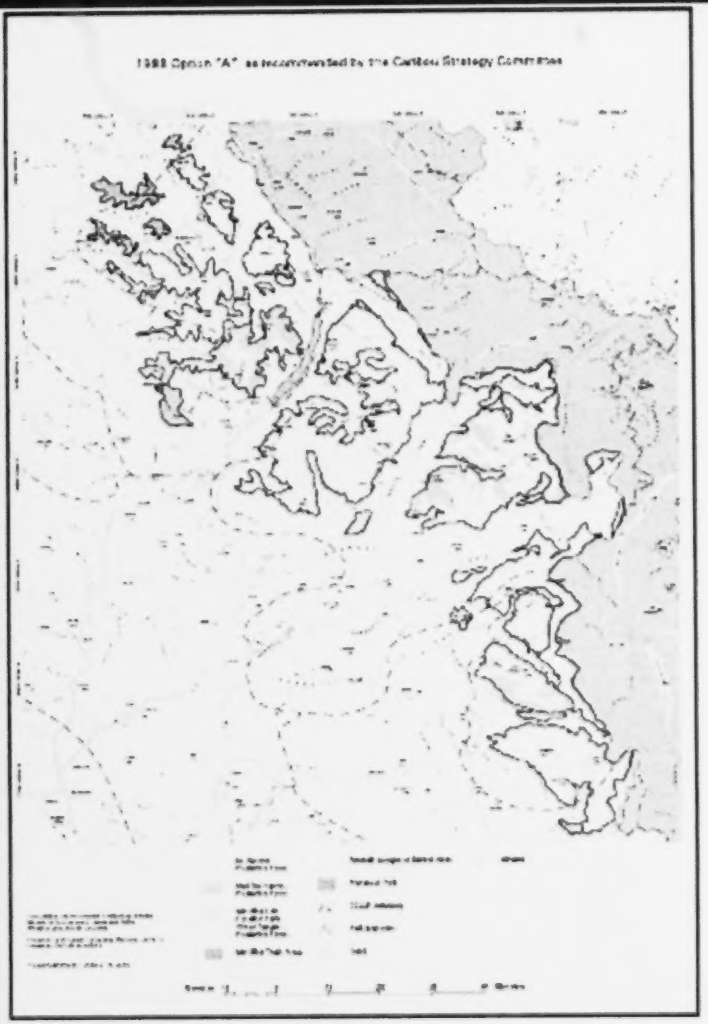
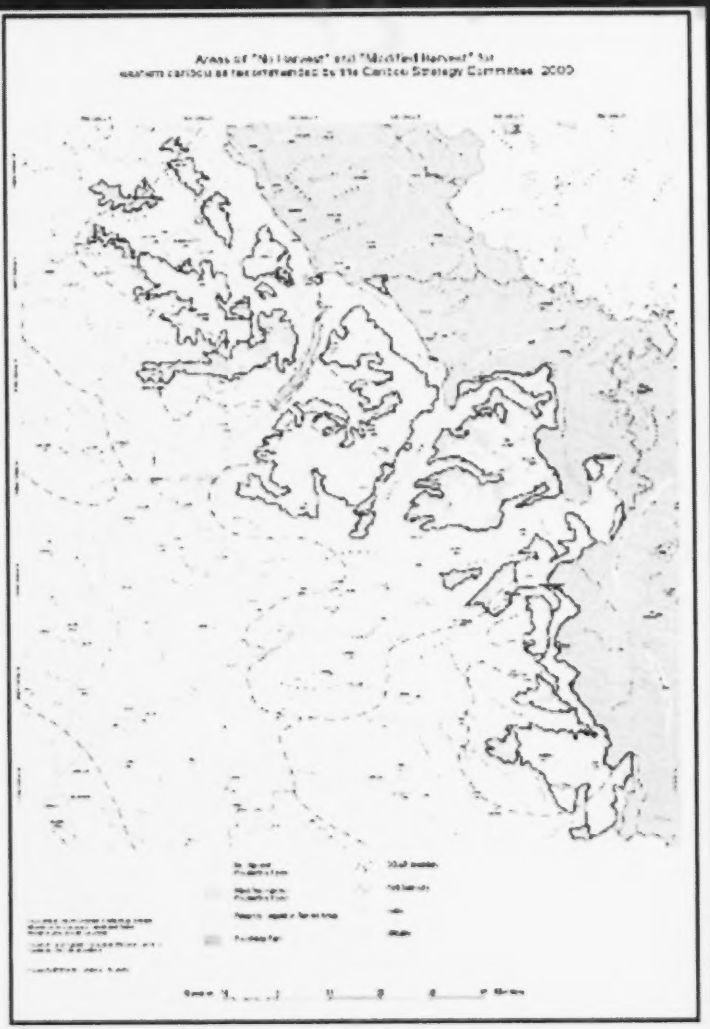
HABITAT STRATEGY

Recommended Location of Mountain Caribou Target





HABITAT STRATEGY

Recommended Location of Mountain Caribou Target

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TOTAL	**53,509**	**86,836**	**140,345**

Recommended distribution of mountain caribou target

CCLUP Sub-Unit	Recommended 'Modified Harvest' Target	Recommended 'No Harvest' Target	Recommended Total Caribou Target
Cottonwood	4,857	6,948	11,805
Canim	965	4,938	5,903
Boss/Deception	4,688	11,751	16,439
Quesnel Highland	15,604	23,230	38,834
Quesnel Lake	27,395	39,969	67,364
TOTAL	**53,509**	**86,836**	**140,345**

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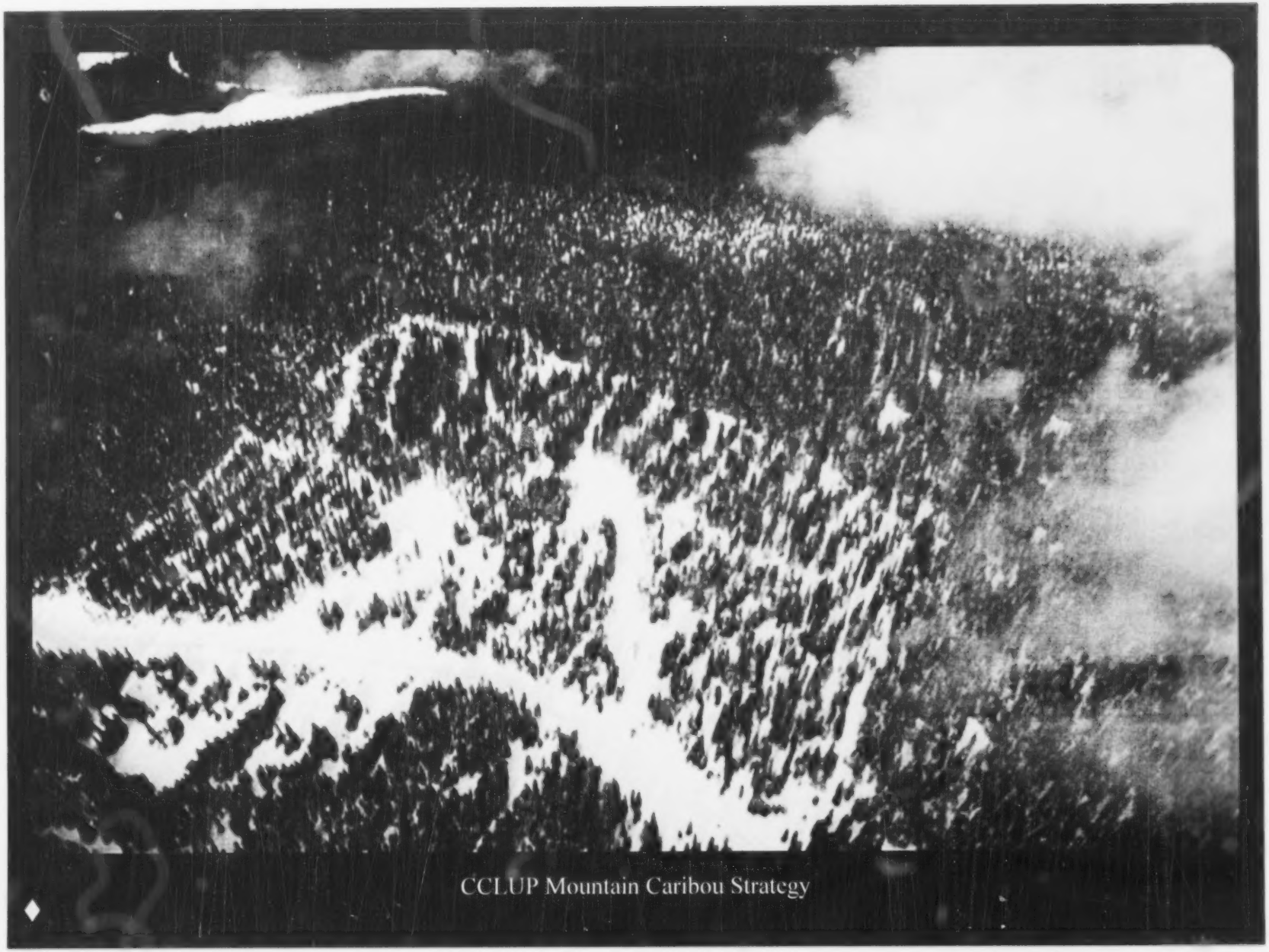
TIMBER HARVESTING STRATEGY

TIMBER HARVESTING STRATEGY

Habitat and Silvicultural Systems Research

- Pilot Trial (1990/1991)
- Replicated Research Trial (1992/1993)
- Adaptive Management Trial (starting 2000-2001)



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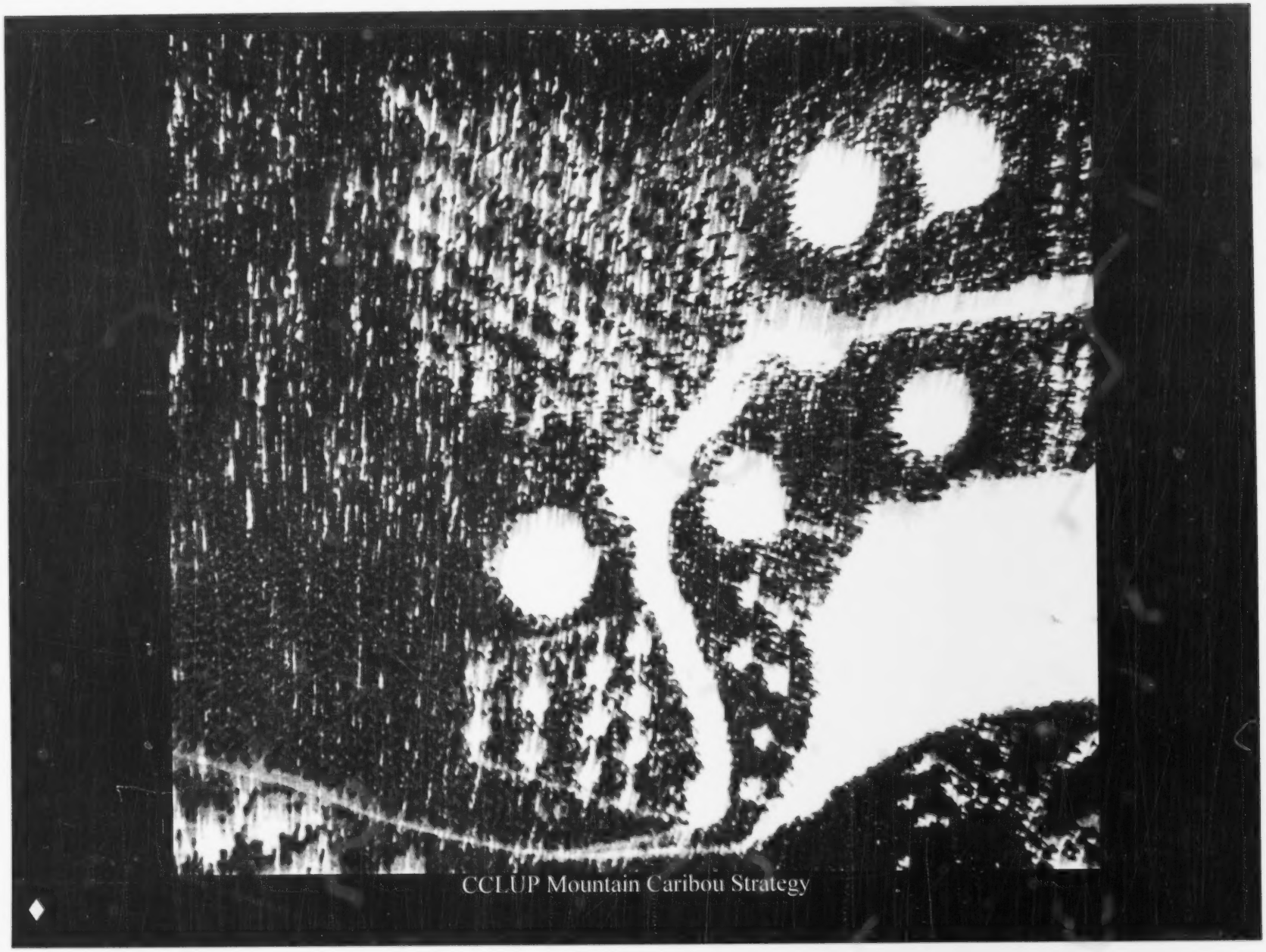

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TIMBER HARVESTING STRATEGY

Habitat and Silvicultural Systems Research

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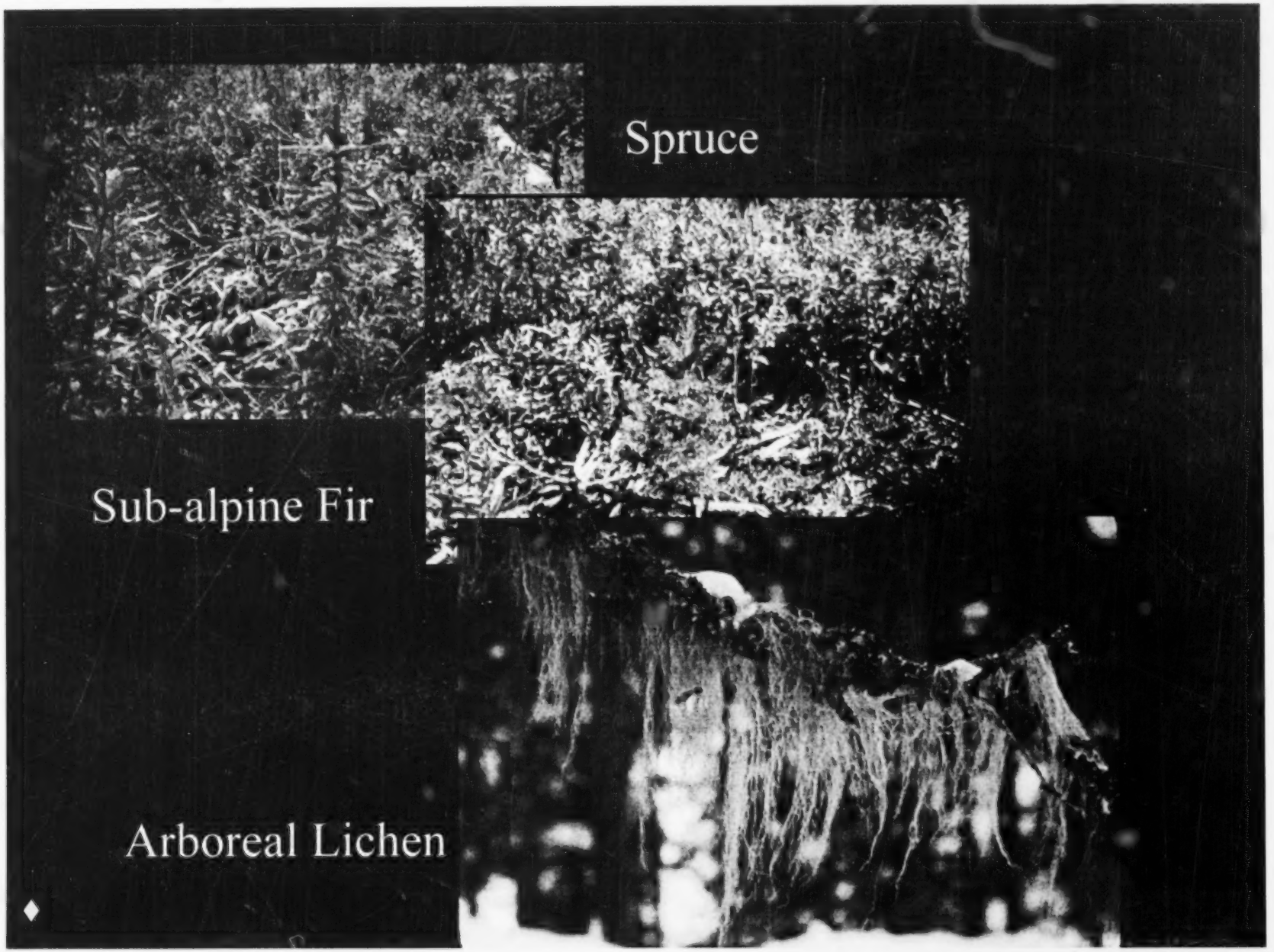
TIMBER HARVESTING STRATEGY

Habitat and Silvicultural Systems Research

Major Results and Conclusions from Group Selection Trials

- Planted spruce and subalpine fir seedling performance in openings from 0.1 to 1.0 ha is adequate and should meet current free-growing standards
- Long-term yield modelled in the CCLUP Integration Report can be achieved
- Lichen growth rates and lichen biomass are somewhat reduced
- Windthrow is not a problem


Spruce
Sub-alpine Fir
Arboreal Lichen

TIMBER HARVESTING STRATEGY

Habitat and Silvicultural Systems Research

Major Conclusions from Other Research

- Corroboration of results in the Cariboo Region for recommended opening sizes and cutting cycles for group selection
- Group selection with openings of 0.24 ha in the ICHwk has produced good seedling survival and growth
- No windthrow problems with the recommended group selection system in ESSF or ICH

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TIMBER HARVESTING STRATEGY

Habitat and Silvicultural Systems Research

Conclusion:

- Based on all sources of information we are optimistic that group selection will be able to maintain caribou habitat and should have no problem producing the modelled timber yield expectations

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TIMBER HARVESTING STRATEGY

General Forest Development Recommendations

- Timber access must be an even flow by TSA (excluding 100 Mile TSA)
  - Limit harvesting to a maximum of 1/3rd of the following areas in any 20-year period: TFL#52, Quesnel TSA, Williams Lake TSA north of Quesnel Lake, Williams Lake TSA south of Quesnel Lake
- Forest development must be spatially and temporally concentrated
- Cutblocks should be large using the recommended selection systems

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TIMBER HARVESTING STRATEGY

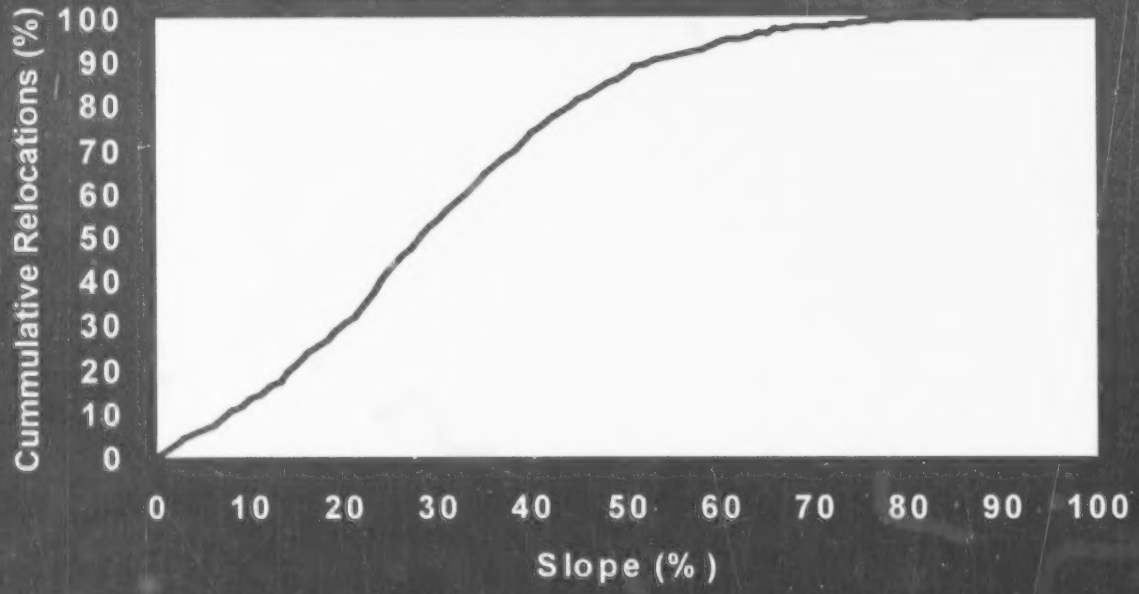
Operational Location of Harvest Boundary

To provide *flexibility* at the operational level boundaries of 'No Harvest' and 'Modified Harvest' can be adjusted with these conditions:

- Adjustments to a maximum of 200 metres
- Adjustments must be neutral or beneficial to caribou
- Adjustments in the opposite direction must be proposed to make up the same area
- Adjustments require approval of the DM and DEO

TIMBER HARVESTING STRATEGY

Cumulative Frequency Distribution of Slope Use by Radio-telemetry Equipped Mountain Caribou



TIMBER HARVESTING STRATEGY

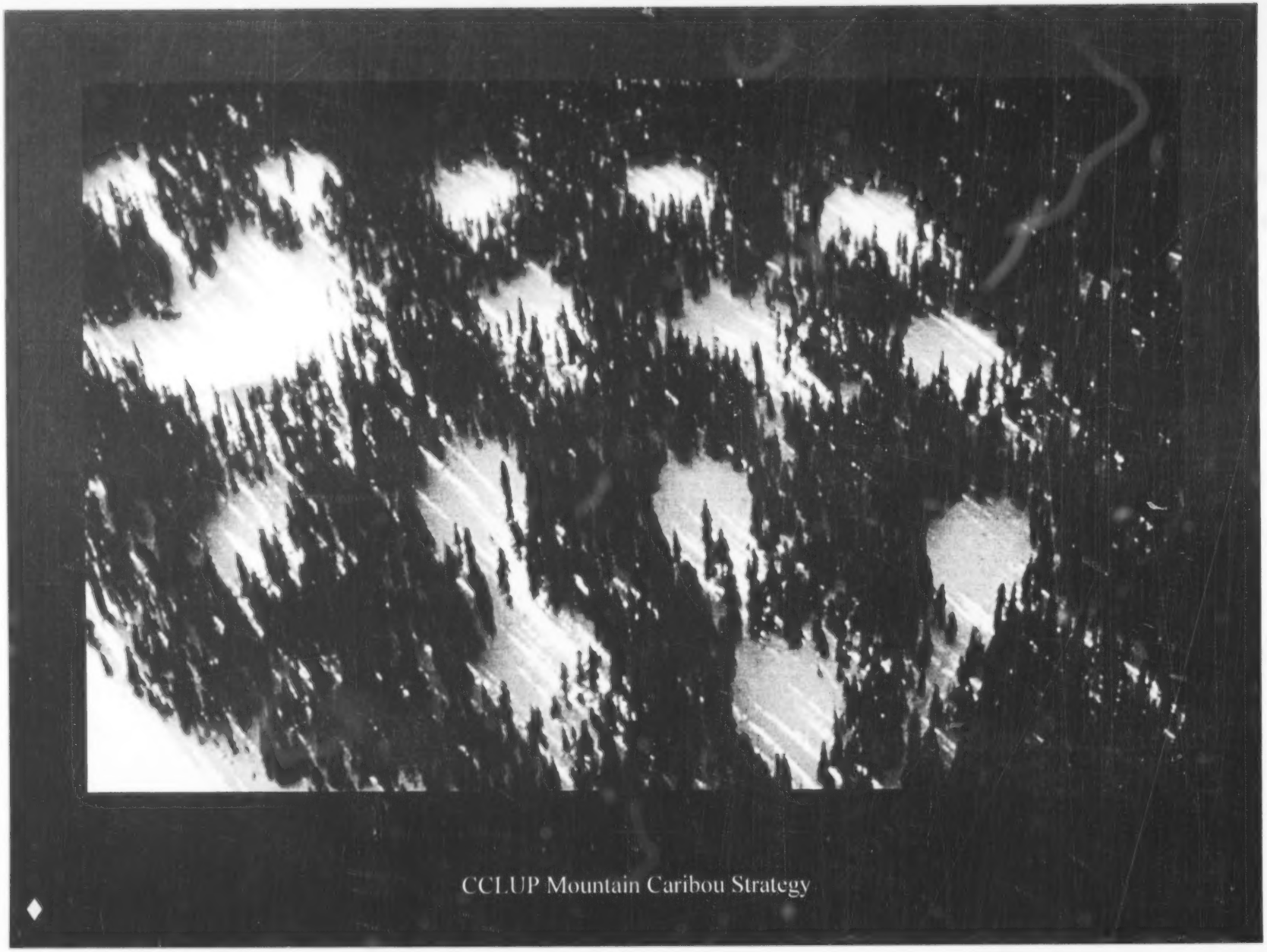
Recommended Silvicultural Systems in 'Modified Harvest' in ESSF and ICH (Group selection is the preferred system on all slopes)

SLOPE (%)	SILVICULTURAL SYSTEM
Gentle or Moderate (0-40)	Group or Single-tree Selection
Moderately Steep (41-50)	Group or Strip selection
Steep (>50)	Strip or Group Selection

TIMBER HARVESTING STRATEGY

Group Selection Recommendations for ESSF and ICH

- 33% removal on an area basis
- 80 year cutting cycle (240 year rotation)
- Openings from 0.2 to 1.0 ha in size
- Shape of openings can vary but should be at least ~2 tree-lengths wide
- Openings should be at least 2 tree-lengths apart
- Safe, standing dead trees outside of openings should be left



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TIMBER HARVESTING STRATEGY

Strip Selection Recommendations for Steep Slopes in the ESSF and ICH

- 33% removal on an area basis
- 80 year cutting cycle (240 year rotation)
- Harvested strips should not be more than 2-3 tree lengths wide
- Residual stand must be windfirm
- Safe, standing dead trees outside of strips should be left

TIMBER HARVESTING STRATEGY

Post-Harvesting Recommendations:

Planting

- Lodgepole pine should not be planted in mountain caribou habitat
- Seedlings should be planted to achieve a clumped distribution

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TIMBER HARVESTING STRATEGY

Appraisal Allowances for 'Modified Harvesting'

- A timely resolution of the appraisal issue is essential to the successful implementation of the caribou strategy

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ACCESS MANAGEMENT

"The long term persistence of mountain caribou is dependent upon a perpetual supply of suitable habitat where there is little or no vehicle access and human disturbance."

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ACCESS MANAGEMENT

- Minimises overall access development by locating 'modified harvest' in large, aggregated areas
- Recommends an *aggregated cut* over short time periods, followed by road de-building
- Recommends an *overall access management plan* for the caribou winter range, addressing road closures and deactivation
- Recommends that *permanent* road access should be minimised throughout caribou range
- Recommends that *motorized recreational access* should be carefully regulated or excluded from sensitive caribou winter range areas

ACCESS MANAGEMENT

"Snowmobile activity on caribou winter ranges is considered a major conservation concern because of its potential displacement impact on caribou distribution"

- Identifies *sensitive areas* where snowmobiling restrictions are necessary in order to maintain caribou use
- A *snowmobile planning process* is currently underway, led by an IAMC technical planning team
- It is critical that a *snowmobile zoning strategy* be developed for the caribou range

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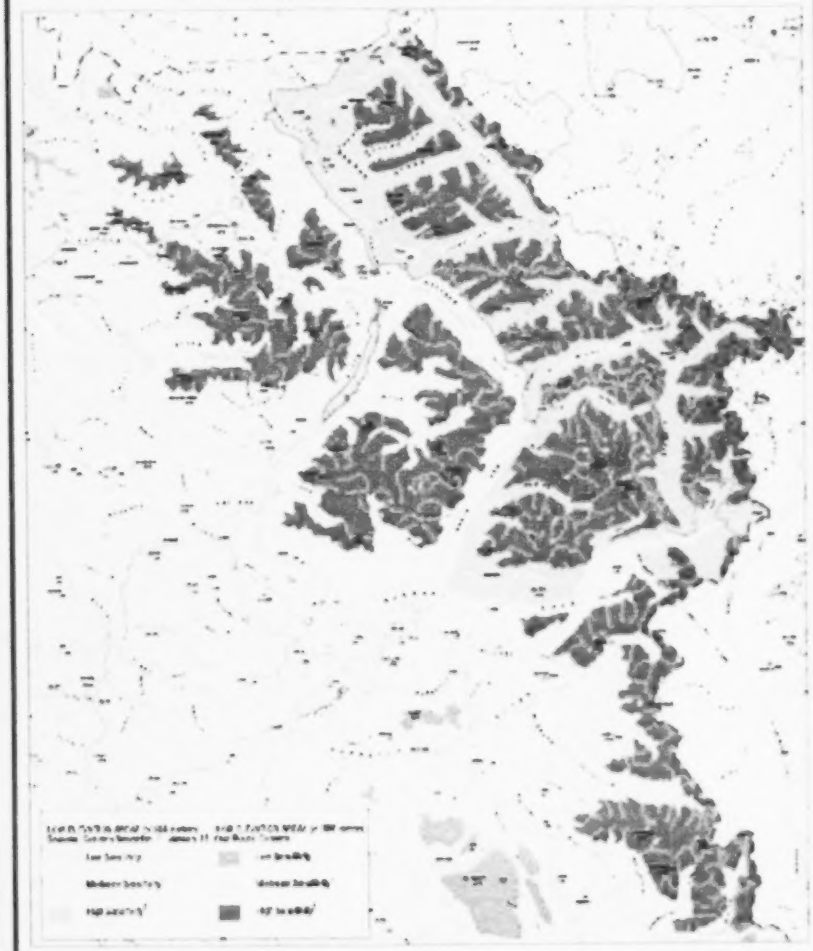
Sensitive caribou areas where recreational uses of snowmobiles, ATVs and helicopters should be carefully regulated and/or excluded



PREDATOR MANAGEMENT

"It is essential that mountain caribou have adequate space to avoid excessive levels of predation. Movement away from areas of high prey numbers… appears to be critical to their long-term survival."

- Recommends development of a modified regional moose management strategy within and adjacent to caribou range
- Recommends development of a wolf management program within caribou range

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CONSERVATION RISK ASSESSMENT

"The mountain caribou population is now red-listed in the province, which is an acknowledgement that there is a risk of extirpation or extinction if current trends continue."

- Identifies risks to maintenance of the caribou population
- Provides preliminary assessments of these risks given entire application of the recommended strategy
- Recommends that further more detailed risk assessment be completed

CCLUP Mountain Caribou Strategy

CONSULTATION

Input to the 1996 Interim Report

- Provided the first approximation of 'modified' and 'no harvest' distribution
- Committee met 5 times with STTAA

Input to the 1998 Interim Report

- Provided a second approximation of 'modified' and 'no harvest' distribution
- Major Licensees and Conservation Council participated in review process
- Several meetings were held with stakeholder representatives

CONSULTATION

Input to the 2000 Report

- Provided a refinement of 'modified' and 'no harvest' boundaries at a detailed scale
- Extended consultation period
- Input incorporated on line work where possible
- Refer to Appendix 2, p. 55

KEY RECOMMENDATIONS

Refined habitat strategy

- Early winter range
- Quesnel trades
- More 'modified harvest' in 100 Mile TSA
- Improved caribou habitat protection

Refined timber harvest strategy

- Flexibility with silvicultural systems on various slopes
- Flexibility for making operational boundary adjustments

KEY RECOMMENDATIONS

Access management strategy

- Identification of sensitive areas where careful regulation or exclusion of motorized recreation is required
- Overall access management plan
- Timber harvest activities aggregated, followed by road de-building

KEY RECOMMENDATIONS

Predator management strategy

- Direct management intervention may be required
- Development of a modified moose management strategy
- Development of a wolf management program

Caribou

Access Habitat Predators

CCLUP Mountain Caribou Strategy

CREDITS

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Ministry of Forests

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